

**WHAT IS CLAIMED IS:**

1. A silica microstructure fabrication method comprising the steps of:
  - partially depositing an etch stop layer on an etching area of a first silica layer
  - 5 formed on a semiconductor substrate;
  - forming a second silica layer on the surfaces of the etch stop layer and the first silica layer;
  - forming a mask patterned according to the shape of the etching area on the surface of the second silica layer;
  - 10 removing the second silica layer from the etching area using the mask by dry etching; and
  - removing the etch stop layer by wet etching.
2. The silica microstructure fabrication method of claim 1, wherein the etch stop layer deposition step comprises the steps of:
  - depositing a photoresist layer on the first silica layer;
  - patterning the photoresist layer according to the shape of the etching area;
  - forming the etch stop layer on the surfaces of the photoresist layer and the first silica layer; and
  - 20 removing the photoresist layer using a photoresist remover.

3. The silica microstructure fabrication method of claim 1, wherein the etch stop layer deposition step comprises the steps of:

- forming the etch stop layer on the first silica layer;
- forming a photoresist layer on the etch stop layer;
- 5 patterning the photoresist layer according to the shape of the etching area; and
- dry-etching the etch stop layer using the photoresist pattern.

4. The silica microstructure fabrication method of claim 1, wherein the etch stop layer is formed of one of metal and ceramic.

10 5. The silica microstructure fabrication method of claim 1, wherein the mask formation step comprises the steps of:

- forming a metal layer on the second silica layer by sputtering;
- forming a photoresist layer on the metal layer;
- 15 patterning the photoresist layer according to the shape of the etching area; and
- etching the metal layer using the photoresist pattern.

20 6. The silica microstructure fabrication method of claim 1, wherein the first and second silica layers are formed by deposition.

7. The silica microstructure fabrication method of claim 1, wherein the second silica layer is dry-etched by RIE (Reactive Ion Etching).

8. The silica microstructure fabrication method of Claim 1, wherein the second silica layer is removed according to a predetermined vertical profile.

9. The silica microstructure fabrication method of Claim 7, wherein the second  
5 silica layer is removed according to a predetermined vertical profile.

10. A silica microstructure according to the process recited in Claim 1.

11. A silica microstructure according to the process recited in Claim 2.

10 12. A silica microstructure according to the process recited in Claim 3.

13. A silica microstructure according to the process recited in Claim 4.

15 14. A silica microstructure according to the process recited in Claim 5.

15. A silica microstructure according to the process recited in Claim 6.

20 16. A silica microstructure according to the process recited in Claim 7.

17. A silica microstructure according to the process recited in Claim 8.

18. A silica microstructure according to the process recited in Claim 9.
19. A silica microstructure according to the process of Claim 7, wherein said microstructure comprises a planar lightwave circuit (PLC).

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20. A silica microstructure according to the process of Claim 8, wherein said microstructure comprises one of a planar lightwave circuit and a microelectromechanical (MEMS) device.